

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please cancel claims 1 and 2, without prejudice to the filing of one or more divisional applications including same.

Listing of Claims

Claims 1 and 2 (Previously Withdrawn and Canceled herein)

SD 1
Claim 3 (Previously Amended): A method of forming a gate stack, comprising:
forming a gate dielectric layer on a silicon substrate;
forming a polysilicon layer on top of the gate dielectric layer;
subjecting said polysilicon layer to an ion implantation of impurities;
depositing a metallic silicide film in a non-annealed state atop said polysilicon layer; and
depositing a dielectric cap layer over said metallic silicide film at a temperature below about 600 °C.

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Claim 4 (Original): The method of claim 3, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature of between 400 °C. and 600 °C .

Claim 5 (Original): The method of claim 3, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature of about 500° C.

Claim 6 (Original): The method of claim 3, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature sufficiently low to maintain said metallic silicide film in said non-annealed state.

Claim 7 (Original): The method of claim 3, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature sufficiently low to preclude formation of silicon clusters in said metallic silicide film.

Claim 8 (Original): The method of claim 3, further comprising forming said dielectric cap layer of silicon nitride.

Claim 9 (Original): The method of claim 3, further comprising forming said metallic silicide film as a cobalt silicide film.

Claim 10 (Original): The method of claim 3, further comprising forming said metallic silicide film as a molybdenum silicide film.

Claim 11 (Original): The method of claim 3, further comprising forming said metallic silicide film as a titanium silicide film.

Claim 12 (Original): The method of claim 3, further comprising forming said metallic silicide film as a tungsten silicide film.

Claim 13 (Original): The method of claim 3, further comprising forming said metallic silicide film as a silicon rich metallic silicide film.

Claim 14 (Original): The method of claim 3, further comprising forming said metallic silicide film with a non-crystalline structure.

Claim 15 (Original): The method of claim 3, wherein said depositing said dielectric cap layer over said metallic silicide film comprises selectively depositing silicon nitride by plasma-enhanced chemical vapor deposition.

Claim 16 (Original): The method of claim 3, wherein said depositing said dielectric cap layer is achieved using a deposition technique selected from the group consisting of chemical vapor deposition, sputtering, and spin-on techniques.

Claim 17 (Original): A method for forming a gate stack, comprising:
providing a semiconductor substrate with a dielectric layer on an active surface of said semiconductor substrate, wherein a polysilicon layer is disposed over said dielectric layer;
forming a metallic silicide film in a non-annealed state over said polysilicon layer;
forming a dielectric cap on said metallic silicide film at a sufficiently low temperature that said metallic silicide film remains in said non-annealed state;
forming and patterning a resist layer on said dielectric cap;
etching said dielectric cap, said metallic silicide film, and said polysilicon layer; and
stripping said resist layer.

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Claim 18 (Original): The method of claim 17, wherein forming said dielectric cap is effected at a temperature below about 600° C.

Claim 19 (Previously Added): A method of forming a gate stack, consisting essentially of:
forming a gate dielectric layer on a silicon substrate;
forming a polysilicon layer on top of the gate dielectric layer;
subjecting said polysilicon layer to an ion implantation of impurities;
depositing a metallic silicide film in a non-annealed state atop said polysilicon layer; and
depositing a dielectric cap layer over said metallic silicide film at a temperature below about 600 °C such that the metallic silicide film remains in said non-annealed state.

Claim 20 (Previously Added): The method of claim 19, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature of between 400°C and 600°C.

Claim 21 (Previously Added): The method of claim 19, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature of about 500°C.

21 Claim 22 (Previously Added): The method of claim 19, wherein said depositing a dielectric cap layer over said metallic silicide film is effected at a temperature sufficiently low to preclude formation of silicon clusters in said metallic silicide film.
